**Stat and Data Analysis CW 7.2 & 7.3**

***\*\* Do all work on separate paper and turn in\*\****

1. The distribution of ages of people at the mall on a Saturday afternoon is as follows: Child 10%, Teen 35%, College-Aged 20%, Parent-Aged 30%, Senior Citizen 5%.
   * 1. Create a probability model
     2. Are the ages disjoint? Justify.
     3. Are the ages independent? Justify.
     4. What is the probability that the next random person that walks by you is a child or a parent?
     5. What is the probability that someone is either a senior or a teen?
     6. What is the probability that the next 3 people you see are college kids?
     7. What is the probability that 4 people walk by and NONE are teens?
     8. What is the probability that the 5th person who walks by is the first parent?
     9. BONUS: What is the probability that if 4 people were to walk by, ***at least 1*** of them was a Parent?
2. A basketball player has been fouled and is going to be shooting two free throws. He historically can make the first shot 64% of the time. If he makes the first one the chance that he makes the second is 86%. If he misses the first shot the chance he makes the second shot is 48%.
   1. Create a tree diagram.
   2. What is the probability that he makes both shots?
   3. What is the probability that he makes at least one shot?
   4. What is the probability that he makes the second shot?
   5. What is the probability that he made the first shot GIVEN THAT he made the second shot?
   6. What is the probability that he missed the first shot IF YOU KNEW he made the second shot?
   7. What is the probability that he missed the first shot if you knew he missed the second shot?
3. From State Police records we find that 78% of suspect drunk drivers get a breath test, 36% a blood test, and 22% get both tests. (Use BR = Breath Test & BL = Blood Test)
   1. Create a Venn Diagram
   2. What is the probability that a random selected suspect drunk driver
      1. Gets only a breath test and not a blood test.
      2. Gets neither test.
      3. Gets a blood test or no breath test
      4. That got a breath test, gets a blood test
      5. That got a breath test, doesn’t get a blood test.
   3. Are getting a breath test and a blood test disjoint? Briefly justify.
   4. Are getting a breath test and a blood test independent? Briefly justify.
4. Given a standard deck of playing cards. Find the probability of each situation.
   1. A heart or a spade
   2. A diamond or a king
   3. A face card or a heart
   4. You are **dealt** 4 hearts (no replacement)
   5. You are dealt a jack and then a queen
   6. You are dealt an 8 and a 10

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5. Assuming all data in S are equally likely, find each of the following:

**S** = sample space = {1, 3, 4, 5, 6, 7, 8, 11, 13, 15, 16, 17, 19, 21, 22, 23, 26, 28, 29, 30}

**E** = {1, 3, 5, 7, 15, 17, 23}

**H**= {4, 6, 8, 16, 22, 26, 28, 30}

**D**= {3, 4, 5, 6, 7, 8, 11, 13, 15}

**C**= {15, 16, 17, 19, 21, 23, 26}

**A** = {1, 5, 15, 16, 22, 26, 28, 30}

**B** = {7, 13, 15, 16, 17, 22, 28, 30}

a. P(H) = b. E∩ H = c. P(E∩ H) = d. Ac =

e. P(Cc) = f. P(E ∩ B) = g. P(A ∩ B) = h. P(E ∩ CC) =

i. P(D ∪ B) = j. P(E ∩ H) = k. P(C∪ AC) =

1. If P(K) = 0.51 and P(M) = 0.22 and P(K ∩ M) = 0.16, find the following:
   1. P(K U M) =
   2. P(M|K) =
   3. P(K|M) =
   4. Are A and B disjoint events? Why or why not?
   5. Are A and B independent? Why or why not?
2. If P(G) = 0.45, P(J) = 0.21 and G and J are disjoint, what is the probability of G or J?
3. If P(W)= 0.50, P(N)= 0.32 and W and N are independent, what is the probability of W and N?
4. If P(A) = 0.63 and P(B) = 0.28 and P(B|A) = 0.20, find the following:
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   2. P(A or B) =
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